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The Spirit River-Clearwater Relationship: Correlation and mapping of an Upper Mannville fluvial-deltaic system in Central Alberta

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ABSTRACT

The Albian aged Upper Mannville group in Central Alberta is composed of a heterolithic mix of marine and non-marine strata, including sandstones, coals, and shales. Subdivisions of the Upper Mannville group are often informal or only locally defined, and much of the Upper Mannville remains 'undifferentiated.' This study presents detailed correlation and mapping of a portion of the middle Upper Mannville Group between the older marine-dominated Glauconitic Formation and the younger continental Notikewin Formation in the area between the town of Sundre and the city of Edmonton.

Two main hydrocarbon-producing pools are present along this fairway: the gas-producing Morningside 'Falher' pool centered near T43-28W4, and the heavy-oil producing Leduc-Woodbend 'Rex' pool centered near T48-26W4. Correlation between these two pools reveals a geologically continuous transition from fluvial-dominated deposits in the southwest that flow northeast towards a deltaic complex. This transition is time equivalent to two of the most prolific oil and gas plays in the Western Canadian Sedimentary Basin: the Spirit River Deep Basin gas play, represented by the Morningside pool, and the Clearwater heavy oil play, represented by the Leduc-Woodbend pool.